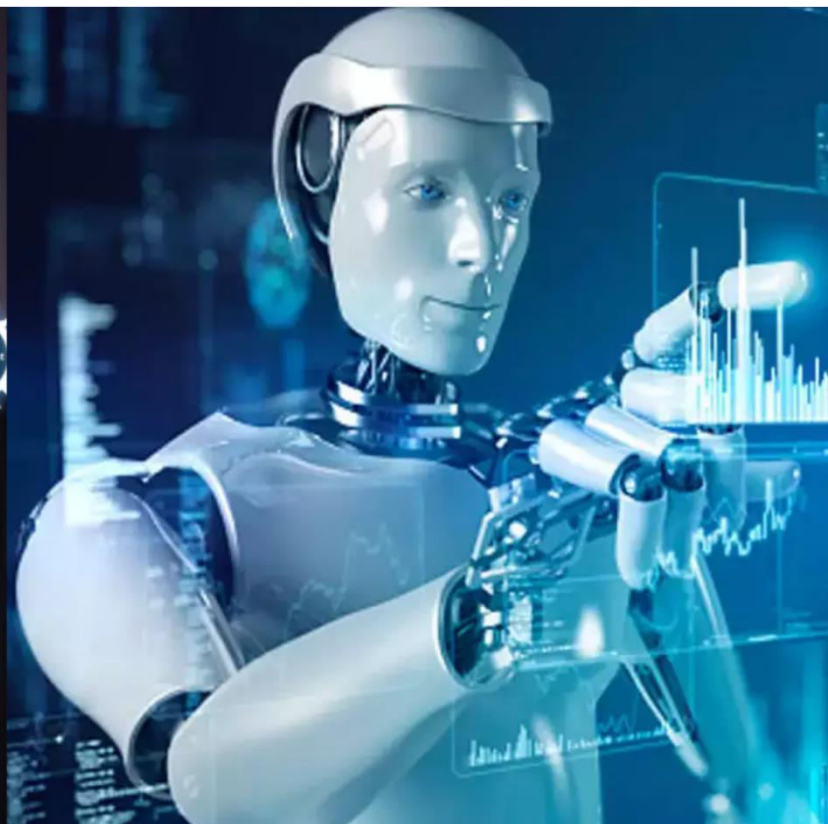




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Road Payment by using Plastic Waste

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ABSTRACT: Plastics are the non-biodegradable materials and so a means to degrade our environment. Plastic wastes have proved to be a source of health hazard as it is toxic in nature. Plastic waste is a big nuisance in today's world. So, this plastic waste should be reused to eliminate the threat to the surroundings. One such reuse can be in the construction of flexible pavements. Plastic coated aggregates have proved to offer better resistance to abrasion and wear and tear.

Moreover the bond between these plastic coated aggregates and the bitumen is also very strong due to increased contact area between plastic (polymers) and bitumen. Such roads show better performance and have increased life spans.

KEYWORDS: Plastic Waste, Reduce Plastic Waste, Plastic Waste As Construction Material, Increase Lifespan

I. INTRODUCTION

Plastic is the most widely used material in the present times. It is light in weight, moisture resistant, flexible and very inexpensive. These qualities increase our propensity towards plastic and hence making its use very common. Today plastic is used in every vital sector of the economy, ranging from agriculture to automobile, electronics, construction, etc. It has revolutionized all spheres of life. But this plastic ultimately becomes a waste. It is a common site both in urban and rural areas to see plastic wastes littering the roads. It forms the major portion of the total municipal solid wastes (MSW). Tons of plastic wastes which include polyethenes, cups, bags, etc. are discarded every year, polluting land, rivers, seas, oceans, etc. plastic is a non-biodegradable material and it has been found that it can remain on earth for about 4500 years without showing any signs of degradation. Its improper disposal can cause serious health hazards in humans. Based on the present usage scenario of plastics, its complete ban will not be justified; hence we have to find the alternatives to reuse the plastics.

It is estimated that approximately 10 thousand tons per day (TPD) of plastics waste is generated i.e. 9% of 1.20 lac's TPD of MSW in India. The plastic waste constitutes two major categories of plastics; (i) Thermoplastics and (ii) Thermoset plastics. Thermoplastics, constitutes 80% and thermoset constitutes approximately 20% of total postconsumer plastics waste generated in India.[11] The Thermoplastics are recyclable plastics which include; Polyethylene Terephthalate (PET), Low Density Poly Ethylene (LDPE), Poly Vinyl Chloride(PVC), High Density Poly Ethylene (HDPE), Polypropylene(PP), Polystyrene (PS) etc. .

II. LITERATURE SURVEY

The plastic wastes have been utilized in the construction of pavements in India since a decade now. It is seen that the use of plastics enhances the rheological properties of bitumen and hence that of the pavement. Considerable research has been carried out to determine the suitability of plastic wastes in the construction of bituminous pavements. Authors (Huda Shafiq, Anzar Hamid)

Investigated that the coating of plastics reduces the porosity, absorption of moisture and improves soundness. He stated that the polymer bitumen blend is a better binder compared to plain bitumen. Blend has increased softening point and decreased Penetration value with a suitable ductility. When it used for road construction it can withstand higher temperature and load. The coating of plastics reduces the porosity, absorption of moisture and improves soundness. The polymer coated aggregate bitumen mix forms better material for flexible pavement construction as the mix shows higher Marshall Stability value and suitable Marshall Coefficient. Hence the use of waste plastics for flexible pavement is one of the best methods for easy disposal of waste plastics. Use of plastic bags in road help in many ways like Easy disposal of waste, better road and prevention of pollution and so on.

III. METHODOLOGY

The plastic waste such as carry bugs, cups, disposables, etc. are shredded in the shedding machine and then spayed in different percentages our the hot aggregates. Waste plastic material cutting into small size between 2.36 mm to 4.75 mm by using agglomerator (Mix Grander). Now plastic waste mix with hot aggregate at temp. 178c. Hot bitumen is added to heat 160c After it's temp 110c to 140c is lay down to sur face. Detail the reinforcement according to accepted practice. With help of road roller road is leveled and planned.

IV. EXPERIMENTAL RESULTS

Fig. 1. Water Absorption Test (a) Weight Before (b) Weight After



(a)



(b)

Sr. No.	Weight Before	Weight After	%Avg
1	373	380	0.789%
2	353	356	
3	399	403	

Fig. 2. Compression Test (a) CTM (b) Result



(a)



(b)

Sr. No.	Compressive Strength (N/CM2)	Avg
1	12.48	
2	14.56	13.24
3	13.24	

V. CONCLUSION

The generation of waste plastics is increasing day by day. The plastics show adhesion property in their molten state. Plastics will increase the melting point of the bitumen. Hence, the use of waste plastics for pavement is one of the best methods for easy disposal of waste plastics. Moreover, plastic is not recyclable and using them in road construction will help in the disposal of these plastic wastes in an eco-friendly manner.



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